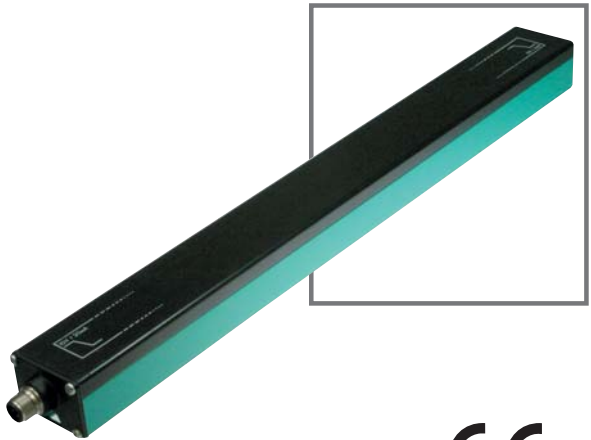


INSTRUCTION MANUAL
INDUCTIVE POSITIONING
SYSTEM F110



1	System overview	3
2	Order information	3
3	Attenuating element	4
4	Installation and operation	4
4.1	Notes on installation	4
4.2	Notes on operation	5
4.3	Definition of measuring range / of measured position	5
5	Technical data	6
5.1	General, electrical and mechanical data	6
5.2	Electrical connection:	7
5.3	Dimensions	7
6	Accessories	8
6.1	Attenuating elements	8
6.2	Mounting brackets	8
7	Notes	9

Used symbols



Warning

This symbol warns the user of potential danger. Nonobservance may lead to personal injury or death and/or damage to property.



Attention

This symbol warns the user of potential device failure. Nonobservance may lead to the complete failure of the device or other devices connected.



Note

This symbol calls attention to important notes.

Security advice

Warning

*This product must not be used in applications, where safety of persons depend on the correct device function.
This product is not a safety device according to EC machinery directive.*

Notes

These operating instructions refer to proper and intended use of this product. They must be read and observed by all persons making use of this product. This product is only able to fulfill the tasks for which it is designed if it is used in accordance with specifications of Pepperl+Fuchs.

The warranty offered by Pepperl+Fuchs for this product is null and void if the product is not used in accordance with the specifications of Pepperl+Fuchs.

Changes to the devices or components and the use of defective or incomplete devices or components are not permitted. Repairs to devices or components may only be performed by Pepperl+Fuchs or authorized work shops. These work shops are responsible for acquiring the latest technical information about Pepperl+Fuchs devices and components. Repair tasks made on the product that are not performed by Pepperl+Fuchs are not subject to influence on the part of Pepperl+Fuchs. Our liability is thus limited to repair tasks that are performed by Pepperl+Fuchs.

The preceding information does not change information regarding warranty and liability in the terms and conditions of sale and delivery of Pepperl+Fuchs.

This device contains sub-assemblies that are electrostatically sensitive. Only qualified specialists may open the device to perform maintenance and repair tasks. Touching the components without protection involves the risk of dangerous electrostatic discharge, and must be avoided. Destruction of basic components caused by an electrostatic discharge voids the warranty!

Subject to technical modifications.

Pepperl+Fuchs GmbH in D-68301 Mannheim maintains a quality assurance system certified according to ISO 9001.



1 System overview

The new inductive position encoding system F110 is optimised for a high-precision, continuous position detection.

Based on the high-precision evaluation of multiple coil systems, the position encoding system F110 is a combination of tried and tested inductive sensor technology and innovative microcontroller technology.

The compact and robust design F110 allows for a contactless and thus wear-free position detection in measuring lengths of 210 mm and 360 mm. Thanks to the integrated temperature compensation, it is also optimally suited for rough environments and critical positioning tasks.

Due to the inductive principle of operation, you do not need any ferrites or magnets as a counterpart. As in the case of an inductive proximity switch, the actuator can be made of any metal.

The advantages of the inductive position encoding system F110 are:

- Very large detection range of 6 mm
- High resolution and accuracy
- Minimum temperature drift
- Contactless
- Low interference sensitivity due to inductive principle of operation

The inductive position encoding system F110 provides a current and voltage signal at the outputs, which is proportional to the position of the attenuating element.

Output signals:

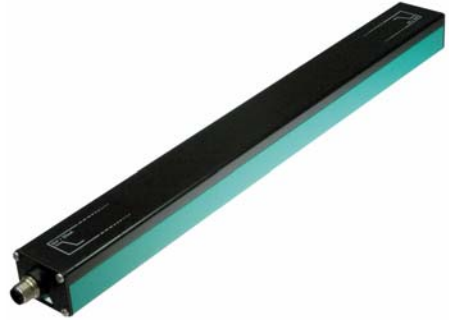
- 4 mA ... 20 mA
- 0 V ... 10 V

2 Order information

The inductive position encoding system F110 is available in different lengths with respective measurement ranges.

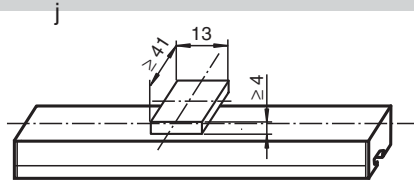
The ordering code is always:

PMIxxx-F110-IU-V1, where **xxx** has to be replaced by the measuring range in mm. The entire housing length is approx. 30 ... 40 mm longer. It is specified in the datasheet of the particular product.



3 Attenuating element

The inductive position encoding system F110 is optimally adjusted to the geometry of the attenuating elements we offer (see chapter 6.1 "Attenuating elements" at page 8).



Attention

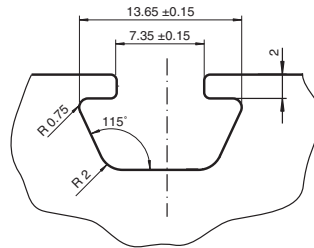
When using your own attenuating elements, you must ensure that the active surface of the attenuating element has a width of exactly 13 mm and overlaps the entire sensor width.

A different width has a direct impact on the achievable resolution and accuracy of the system.

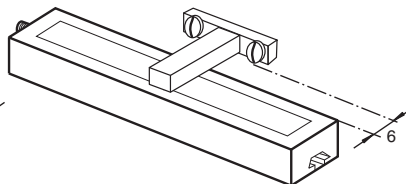
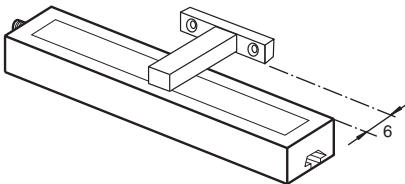
4 Installation and operation

4.1 Notes on installation

- A flush installation is possible.
- To extend the measurement range, the inductive position encoding system F110 may be mounted in rows (both side by side as well as one after the other) without minimum distance.



- The distance between the measuring field and the fixing base or fixing element of the attenuating element must at least be 6 mm.



Document No. DOCT.0978D

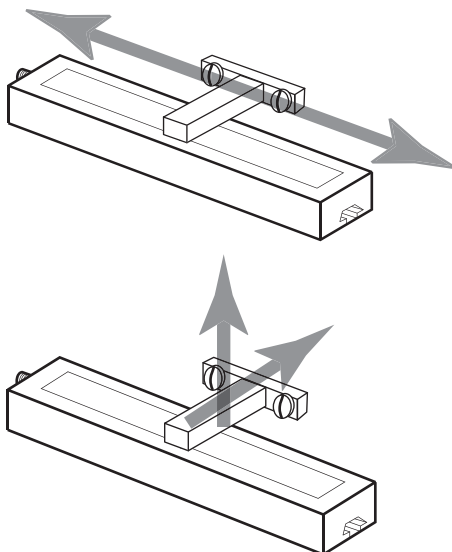
Part No. 1 94089

Date of edition: 2016/12/02

4.2 Notes on operation

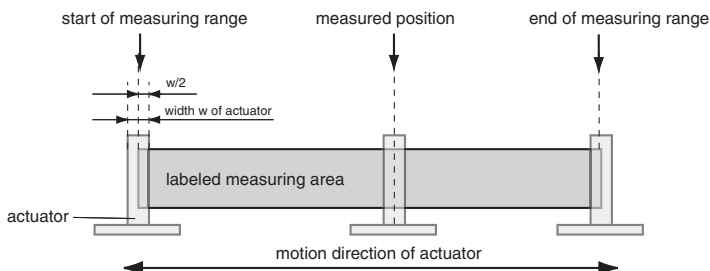
When the attenuating element leaves the measurement range (figures below):

- the last valid value is maintained at the voltage output until the attenuating element re-enters the valid range.
- the last valid value is maintained at the current output for 0.5 seconds. Afterwards, the output changes to a fault current of 3.6 mA until the attenuating element re-enters the valid range.
- the switching stages keep the current state for 0.5 seconds. Afterwards, an active switch output changes into the quiescent state ("Open" position).



4.3 Definition of measuring range / of measured position

The measured attenuating elements (actuators) position refers to half its width (middle of the actuator). The measuring range starts and ends when the attenuating element overlaps the labeled measuring area on the sensor at transversal motion.



5 Technical data

5.1 General, electrical and mechanical data

Type	PMIxxx-F110-IU-V1
General data	
Switch element function	Analogue, current or voltage output
Object distance	max. 6 mm
Installation	Embeddable
Measurement range	type specific, see datasheet
Characteristics	
Operating voltage U_B	18 ... 30 V
Polarity protection	Reverse polarity protected
Short circuit protection	pulsing
Output current	4 ... 20 mA
Output voltage	0 ... 10 V
Voltage drop U_d	-
Linearity error	± 0.4 mm
Temperature drift	± 0.5 mm (-25 °C ... 70 °C)
Repeat accuracy	± 0.2 mm
Resolution	type specific, see datasheet
Operating current I_L	-
No load current I_0	≤ 40 mA
Load resistance	Voltage output: $> 1000 \Omega$ Current output: $< 400 \Omega$
Operating voltage display	Green LED
Standards compliance	
EMC according to	IEC / EN 60947-5-2:2004
Standards	IEC / EN 60947-5-2:2004
Ambient conditions	
Ambient temperature	-25 ... 70 °C (248 ... 343 K)
Mechanical data	
Connection type	M12 connector
Housing material	PA 6 / AL
Protection degree	IP65
Length of housing	type specific, see datasheet

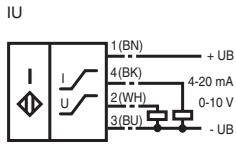
Note: The accuracy values only apply for a distance of the object to be detected of 1 ... 6 mm.

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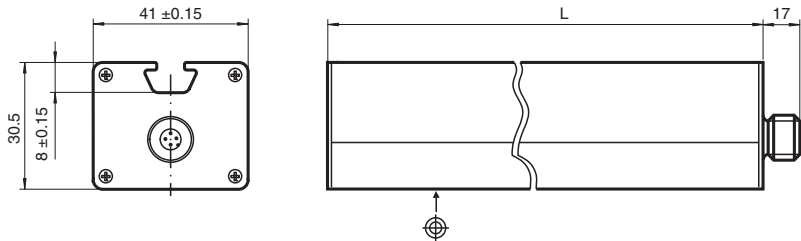
5.2 Electrical connection:



PMI...F110IU-V1

It can be connected via connector M12 x1, 4-pin

5.3 Dimensions



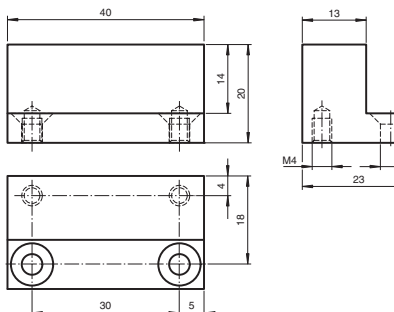
6 Accessories

6.1 Attenuating elements

BT-F110-G



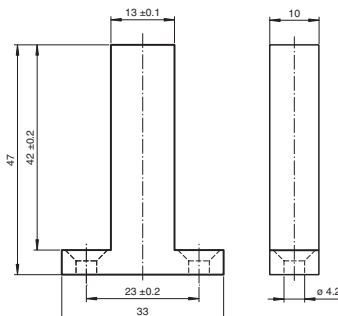
Material: steel ST37



BT-F110-W



Material: steel ST37



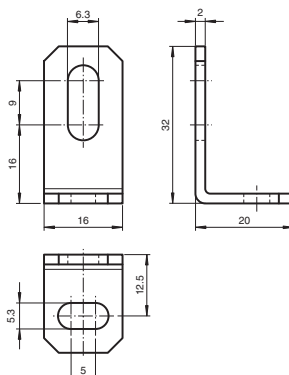
6.2 Mounting brackets

MH-F110



Material: sheet metal, zinc coated

Scope of delivery: 2 units



Doc. No. 1 9428 9 Document No. DOCT-037/8D

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7 Notes

Document No. DOCT-087-8D

Part No. 1 943 9

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FACTORY AUTOMATION – SENSING YOUR NEEDS



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